

CLAIM(S)

What is claimed is:

- 5     1. A process for producing a multi-coat system on a substrate comprising:
- 10     (a) mixing a cross-linkable component of a coating composition with a crosslinking component of said coating composition to form a pot-mix, said crosslinkable component comprising an acid functional acrylic copolymer polymerized from a monomer mixture comprising 2 weight percent to 12 weight percent of carboxylic acid group containing monomer based on total weight of the acid functional acrylic copolymer, and 0.2 weight percent to 2 weight percent of amorphous silica based on total weight of the crosslinkable component;
- 15     (b) applying a layer of said pot-mix over said substrate;
- (c) flashing said layer of said pot-mix into a strike-in resistant layer;
- (d) applying a layer of a clearcoat composition over said strike-in resistant layer to form a multi-layer system on said substrate; and
- (e) curing said multi-layer system into said multi-coat system.
- 20     2. The process of claim 1 wherein a time period of said flashing step ranges from 5 to 15 minutes.
3. The process of claim 1 wherein said curing step takes place under ambient conditions, at elevated temperatures, or under ambient conditions followed by elevated temperatures.
4. The process of claim 1 or 3 elevated temperatures.
- 25     5. The process of claim 1 further comprising producing a primer coat on said substrate before said step (b).
6. The process of claim 1 further comprising producing an E-coat followed by a primer coat on said substrate with before said step (b).
- 30     7. The process of claim 1 wherein said acid functional acrylic copolymer has a GPC weight average molecular weight ranging from 8,000 to 100,000 and a polydispersity ranging from 1.05 to 10.0.
8. The process of claim 1 wherein said acid functional acrylic copolymer has Tg ranging from -5°C to + 100°C.

9. The process of claim 1 wherein said monomer mixture comprises one or more functional (meth)acrylate monomers and one or more non-functional (meth)acrylate monomers.
- 5 10. The process of claim 7 wherein said monomer mixture comprises 5 percent to 40 percent based on total weight of the acid functional acrylic copolymer of said functional (meth)acrylate monomers.
- 10 11. The process of claim 8 wherein said functional (meth)acrylate monomer is provided with one or more crosslinkable groups selected from the group consisting of a primary hydroxyl, secondary hydroxyl and a combination thereof.
12. The process of claim 1 wherein said crosslinking component comprises a polyisocyanate, melamine or a combination thereof.
- 15 13. The process of claim 11 wherein a ratio of equivalents of isocyanate functionalities on said polyisocyanate per equivalents of the functional groups on said acid functional acrylic copolymer ranges from 0.5/1 to 3.0/1.
14. The process of claim 11 comprising 0.1 weight percent to 40 weight percent of said melamine, wherein said percentages are based on total weight of composition solids.
- 20 15. The process of claim 11 further comprising accelerating said (d) step by adding a catalytically active amount of a catalyst to said composition.
16. The process of claim 14 further comprising accelerating said (d) step by adding a catalytically active amount of an acid catalyst to said composition.
- 25 17. The process of claim 1 wherein said coating composition comprises pigment.
18. The process of claim 1 formulated as an automotive OEM composition.
19. The process of claim 1 formulated as an automotive refinish composition.
- 30 20. The process of claim 1, 17, 18 or 19 wherein said substrate is an automotive body.

21. The process of claim wherein said composition is formulated as a low VOC coating composition comprising a solvent ranging of from 0.1 kilograms (1.0 pounds per gallon) to 0.72 kilograms (6.0 pounds per gallon) per liter of said composition.
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